Module 3
Step 2: Visual Identification of Hazards

Healthy Housing Solutions Inc.

Trainer preparation

1. You'll need to have post-it notes to provide to the students for the exercise on slide 49.
   - 3" x 3" is fine
   - One pack each of 100 sheets in three colors
2. There is a poster-sized version of the table on slide 49 that is provided to you as part of the non-binder supplies for the course. Put this poster up on a wall where there is plenty of access for students to walk up to it.
3. For slide 10, come up with 3 – 4 descriptions of home visits you made to conduct assessments. Flesh out details about the visit trigger, the hypothesis you developed before the visit, the hazards you actually found and whether the hypothesis turned out to be true or false.

Key Steps

1. Start with the resident

2. Visual (qualitative) identification of hazards

Observe

Interpret

Question

3. Support visual identification with quantitative measurement (if necessary)

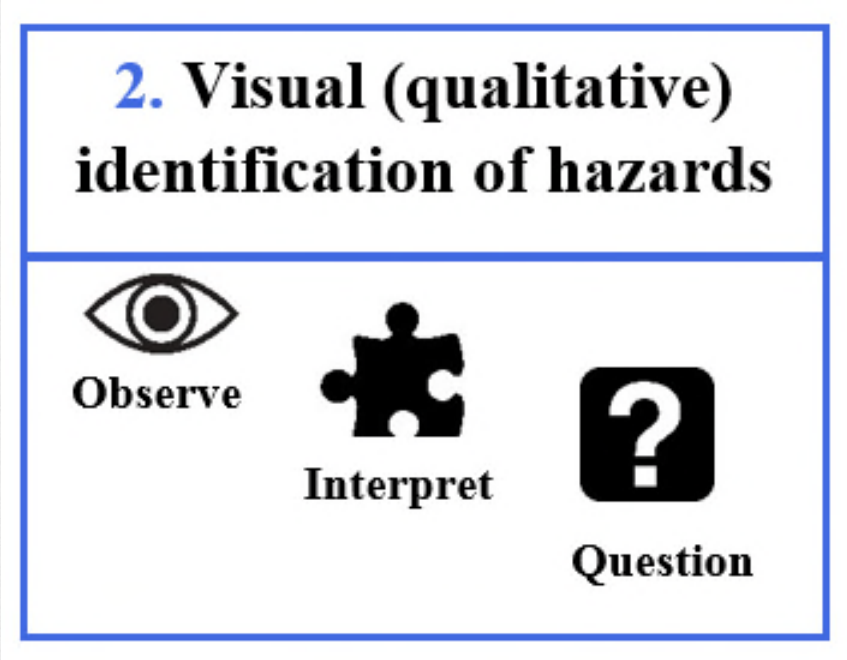
4. Justify and prioritize hazards

1. ___
2. ___
3. ___

5. Identify interventions to address hazards

6. Communicate with the resident

Module Topics



- Visual assessment tools
- Developing a hypothesis
- Risk assessment
- The assessment process
- Practice
- Extra focus on pests

Who can list the eight Keep It principles?

Remember the Eight Principles

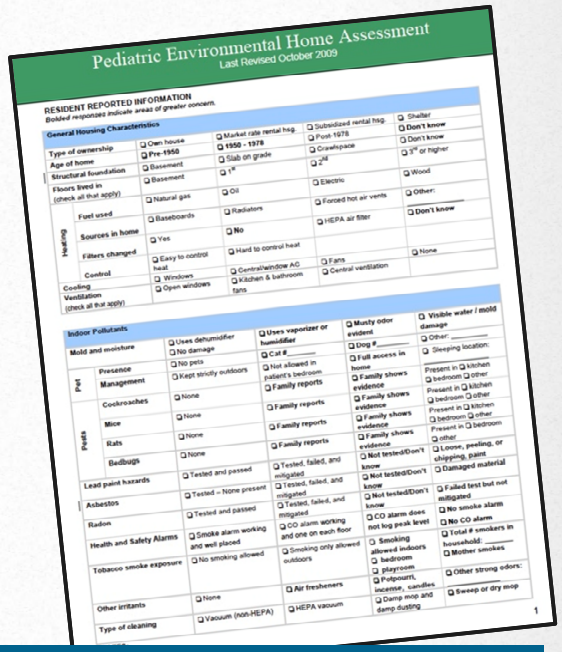
Visual Assessment Tools

Interview and visual assessment tools

- Most interview tools have a visual assessment component.
- Bottom line is what works for you to do an assessment in a structured way.

Sample checklists

- Allies Against Asthma
- ASTM D7297 IEQ Assessment
- CEHRC (available in the Essentials course materials)
- Children's Mercy Hospital Environmental Health Assessment form
- Environmental Protection Agency Home Visit
- Harvard School of Public Health
- U.S. Department of Housing & Urban Development Healthy Homes Rating System
- King County/Seattle
- Pediatric Environmental Home Assessment form


Pediatric Environmental Home Assessment
Last Revised October 2009

RESIDENT REPORTED INFORMATION
Bolded responses indicate areas of greater concern.

General Housing Characteristics

Type of ownership	❑ Own house	❑ Market rate rental hsg.	❑ Subsidized rental hsg.	❑ Shelter
Age of home	❑ Pre-1950	❑ 1950 - 1978	❑ Post-1978	❑ Don't know
Structural foundation	❑ Basement	❑ Slab on grade	❑ Crawlspace	❑ 3rd or higher
Floors lived in (check all that apply)	❑ Basement	❑ 1st	❑ 2nd	❑ Wood
Heating: Fuel used	❑ Natural gas	❑ Oil	❑ Electric	❑ Other: _____
Heating: Sources in home	❑ Baseboards	❑ Radiators	❑ Forced hot air vents	❑ Don't know
Heating: Filters changed	❑ Yes	❑ No	❑ HEPA air filter	
Heating: Control	❑ Easy to control heat	❑ Hard to control heat		
Cooling Ventilation (check all that apply)	❑ Windows ❑ Open windows	❑ Central/window AC ❑ Kitchen & bathroom fans	❑ Fans ❑ Central ventilation	❑ None

Indoor Pollutants

Mold and moisture	❑ Uses dehumidifier ❑ No damage	❑ Uses vaporizer or humidifier	❑ Musty odor evident	❑ Visible water / mold damage
Pet: Presence	❑ No pets	❑ Cat #_____	❑ Dog #_____	❑ Other: _____
Pet: Management	❑ Kept strictly outdoors	❑ Not allowed in patient's bedroom	❑ Full access in home	❑ Sleeping location: _____
Pests: Cockroaches	❑ None	❑ Family reports	❑ Family shows evidence	Present in ❑ kitchen ❑ bedroom ❑ other
Pests: Mice	❑ None	❑ Family reports	❑ Family shows evidence	Present in ❑ kitchen ❑ bedroom ❑ other
Pests: Rats	❑ None	❑ Family reports	❑ Family shows evidence	Present in ❑ kitchen ❑ bedroom ❑ other
Pests: Bedbugs	❑ None	❑ Family reports	❑ Family shows evidence	Present in ❑ bedroom ❑ other
Lead paint hazards	❑ Tested and passed	❑ Tested, failed, and mitigated	❑ Not tested/Don't know	❑ Loose, peeling, or chipping, paint
Asbestos	❑ Tested – None present	❑ Tested, failed, and mitigated	❑ Not tested/Don't know	❑ Damaged material
Radon	❑ Tested and passed	❑ Tested, failed, and mitigated	❑ Not tested/Don't know	❑ Failed test but not mitigated
Health and Safety Alarms	❑ Smoke alarm working and well placed	❑ CO alarm working and one on each floor	❑ CO alarm does not log peak level	❑ No smoke alarm ❑ No CO alarm
Tobacco smoke exposure	❑ No smoking allowed	❑ Smoking only allowed outdoors	❑ Smoking allowed indoors ❑ bedroom ❑ playroom	❑ Total # smokers in household: _____ ❑ Mother smokes
Other irritants	❑ None	❑ Air fresheners	❑ Potpourri, incense, candles	❑ Other strong odors: _____
Type of cleaning	❑ Vacuum (non-HEPA)	❑ HEPA vacuum	❑ Damp mop and damp dusting	❑ Sweep or dry mop

1

May be the same tool as the Interview tool in Step 1

Developing a Hypothesis

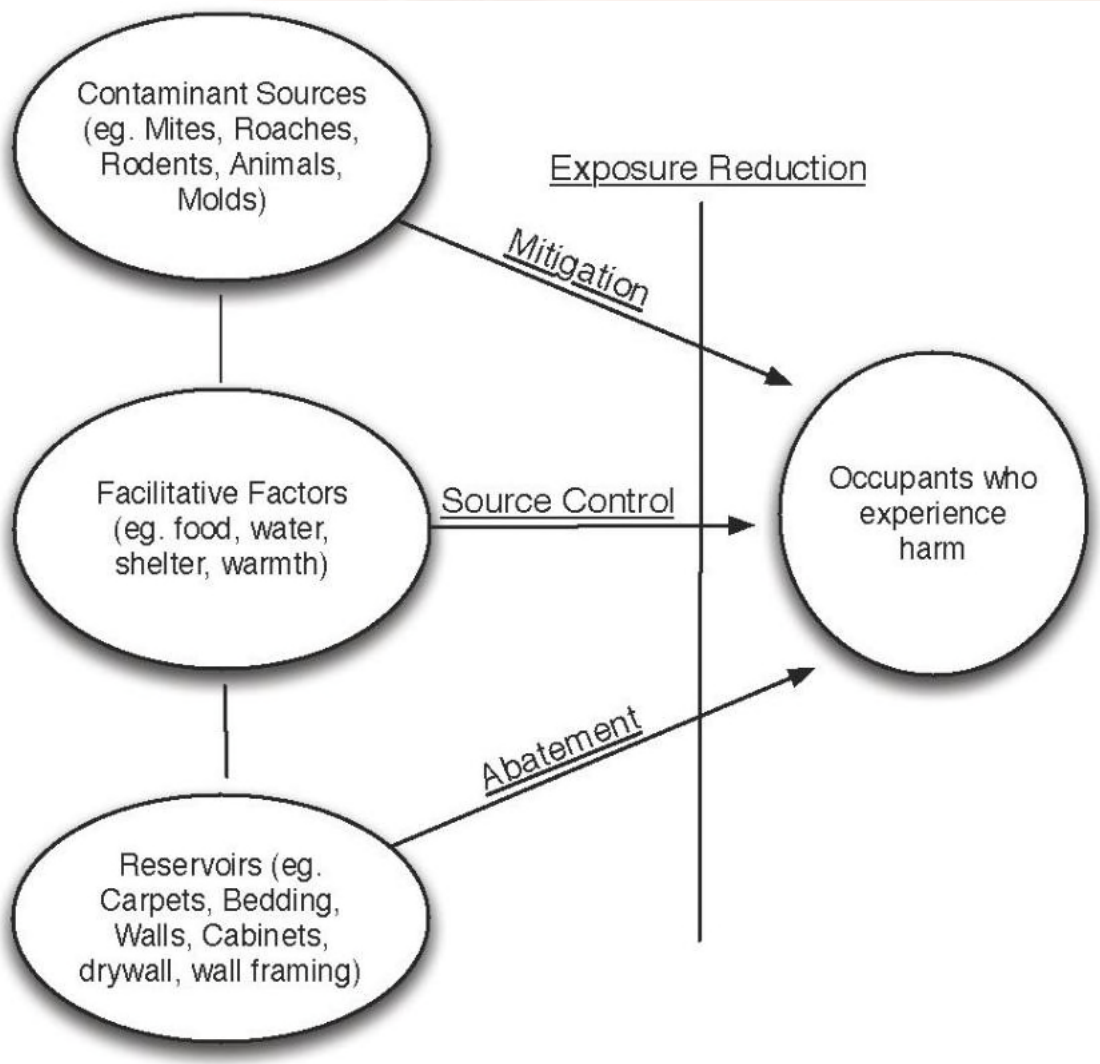
The Hypothesis

- Start with a hypothesis that covers the purpose of the assessment (not the complaint).
- A hypothesis is a testable statement.

Remember: only health providers can make health and environment connections.

Risk Assessment

Home Environmental Assessment Should Guide Exposure Reduction



Ciaccio, Christina E. MD, Kevin Kennedy, MPH, Jay M. Portnoy, MD,
A New Model for Environmental Assessment and Exposure Reduction
Current Allergy and Asthma Reports
December 2012, Volume 12, Issue 6, pp 650-655

Assessments should:

- Identify the nature and extent of individual hazards: **Risk Assessment**
- Determine the relative risk of different hazards: **Risk Analysis**
- Evaluate the interactions and synergisms between individual hazards: **Risk characterization**

Source: HUD Healthy Homes Issues: Residential Assessments, March 2006

Risk Assessment

Risk Assessment is a systematic method of collecting and interpreting scientific information relating environmental hazards to human health.

Risk Assessment is a process of quantifying the likelihood of harmful effects from a hazard.

Risk assessment is NOT making medical statements or connections.

Risk Assessment in the Federal Government: Managing the Process", National Research Council, © 1983

Home Assessments are Risk Assessments

Risk Assessment Steps*

- Hazard Identification
- Hazard Evaluation
  - Consider dose-response
- Exposure Assessment
- Risk Characterization

**National Research Council, 1983*

Risk assessments include risk-benefit analysis with the goal:

to reduce exposure to hazard whenever possible

- Example: Avoid sun exposure

to accept substantial hazard only for great benefit

- Example: Flying versus driving

to accept minor hazard for modest benefit; and

- Example: Hair dying or coloring

to accept no hazard at all when the benefit seems relatively trivial

- Example: Tanning beds (is there a health risk?)

Philip Handler (1979), President of U.S. National Academy of Sciences 1969 to 1981

The Assessment Process

Observe, Interpret and Question

- **Observe, interpret and question steps** are a mini-sequence, within the evaluation.
- **First** - observe hazards and identify them.
- **Second** - interpret what you see.
- **Third** - follow up questions for the resident based on what you've observed.

- Water stain example, ask the resident **"Did this water stain appear recently or has it been there a while?**

More on Interpretation

- Interpretations are a combination of professional knowledge, experience and logic.
- Some interpretations may require research evidence to support conclusions.

What myths have you encountered?

What About Rental Property?

- Assessment allowed if non-destructive
- Family should provide report to Landlord
- Issues identified that are code violations may need to be reported to code enforcement.

Acute Hazards: (review)

Hazards that require immediate attention due to the potential for posing an imminent danger to life and health.

Examples include:

- Physical: loose stairs, child access to crawl spaces, structural deterioration or significant damage etc.,
- Biological hazards: Sewer back ups on carpets where people are using the room, etc.,
- Chemical hazards: poisons, drugs, chemicals, lead paint/dust hazards, detectable carbon monoxide or gas leaks, etc.,

Chronic Hazards: (review)

Hazards which do not pose an immediate danger to life and health but do promote allergies, asthma, lead poisoning, pesticide exposure, or other chronic health conditions.

Examples include:

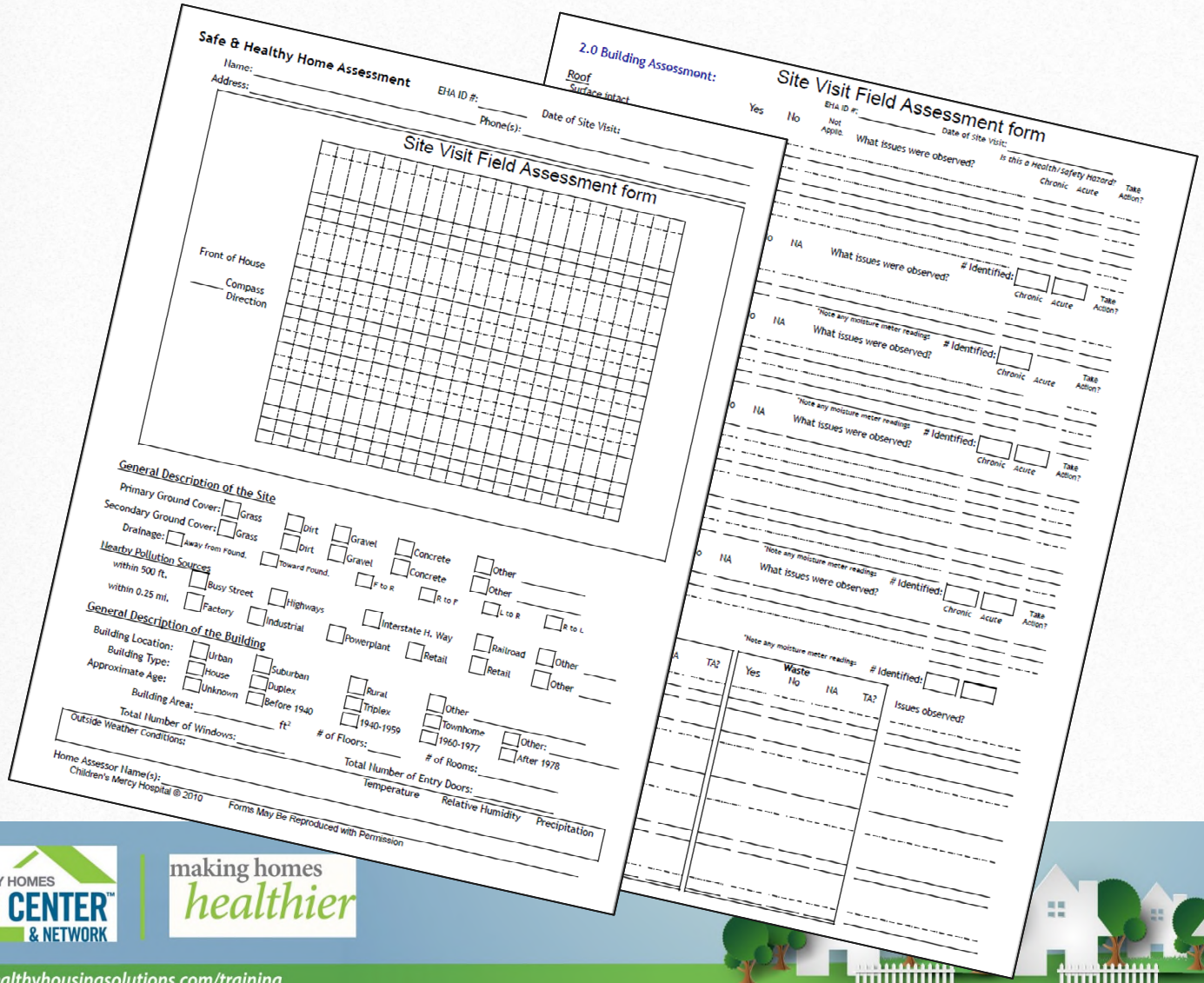
Physical: Poor HVAC maintenance, windows in disrepair, foundation cracks, minor roof damage, plumbing leaks

Biological: Observed/reported pests, condensation and microbial growth, open cracks/gaps in siding, wet/damp drywall

Chemical: poorly operating stove, lack of ventilation/ exhaust fans in bathrooms and over gas stoves

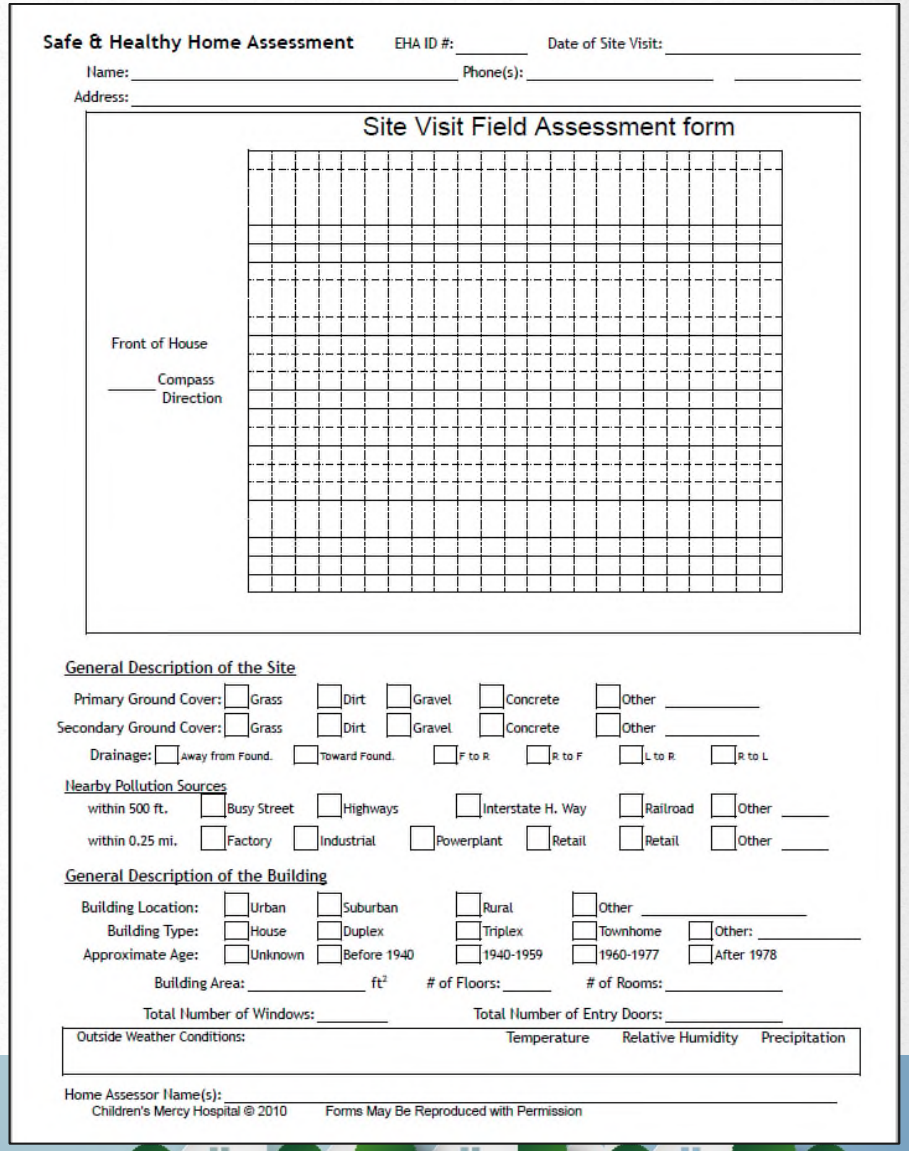
Refer to Site Visit forms

Same forms that will be used in the site visit.



Qualitative or Visual Assessment

- Areas to Assess:
  - Exterior
  - Structural Components
  - Mechanical Components
  - Room by Room Visual Assessment
  - Floor Plan



Safe & Healthy Home Assessment EHA ID #: _____ Date of Site Visit: _____

Name: _____ Phone(s): _____

Address: _____

Site Visit Field Assessment form

Front of House

_____ Compass Direction

General Description of the Site

Primary Ground Cover: ☐ Grass ☐ Dirt ☐ Gravel ☐ Concrete ☐ Other _____

Secondary Ground Cover: ☐ Grass ☐ Dirt ☐ Gravel ☐ Concrete ☐ Other _____

Drainage: ☐ Away from Found. ☐ Toward Found. ☐ F to R ☐ R to F ☐ L to R ☐ R to L

Nearby Pollution Sources

within 500 ft. ☐ Busy Street ☐ Highways ☐ Interstate H. Way ☐ Railroad ☐ Other _____

within 0.25 mi. ☐ Factory ☐ Industrial ☐ Powerplant ☐ Retail ☐ Retail ☐ Other _____

General Description of the Building

Building Location: ☐ Urban ☐ Suburban ☐ Rural ☐ Other _____

Building Type: ☐ House ☐ Duplex ☐ Triplex ☐ Townhome ☐ Other: _____

Approximate Age: ☐ Unknown ☐ Before 1940 ☐ 1940-1959 ☐ 1960-1977 ☐ After 1978

Building Area: _____ ft^2 # of Floors: _____ # of Rooms: _____

Total Number of Windows: _____ Total Number of Entry Doors: _____

Outside Weather Conditions: Temperature Relative Humidity Precipitation

Home Assessor Name(s): _____

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Home Assessment Process

Where should a home assessment start?

- Outside?
- Living Room?
- Basement?
- Child bedroom?

Investigations are an Iterative Process

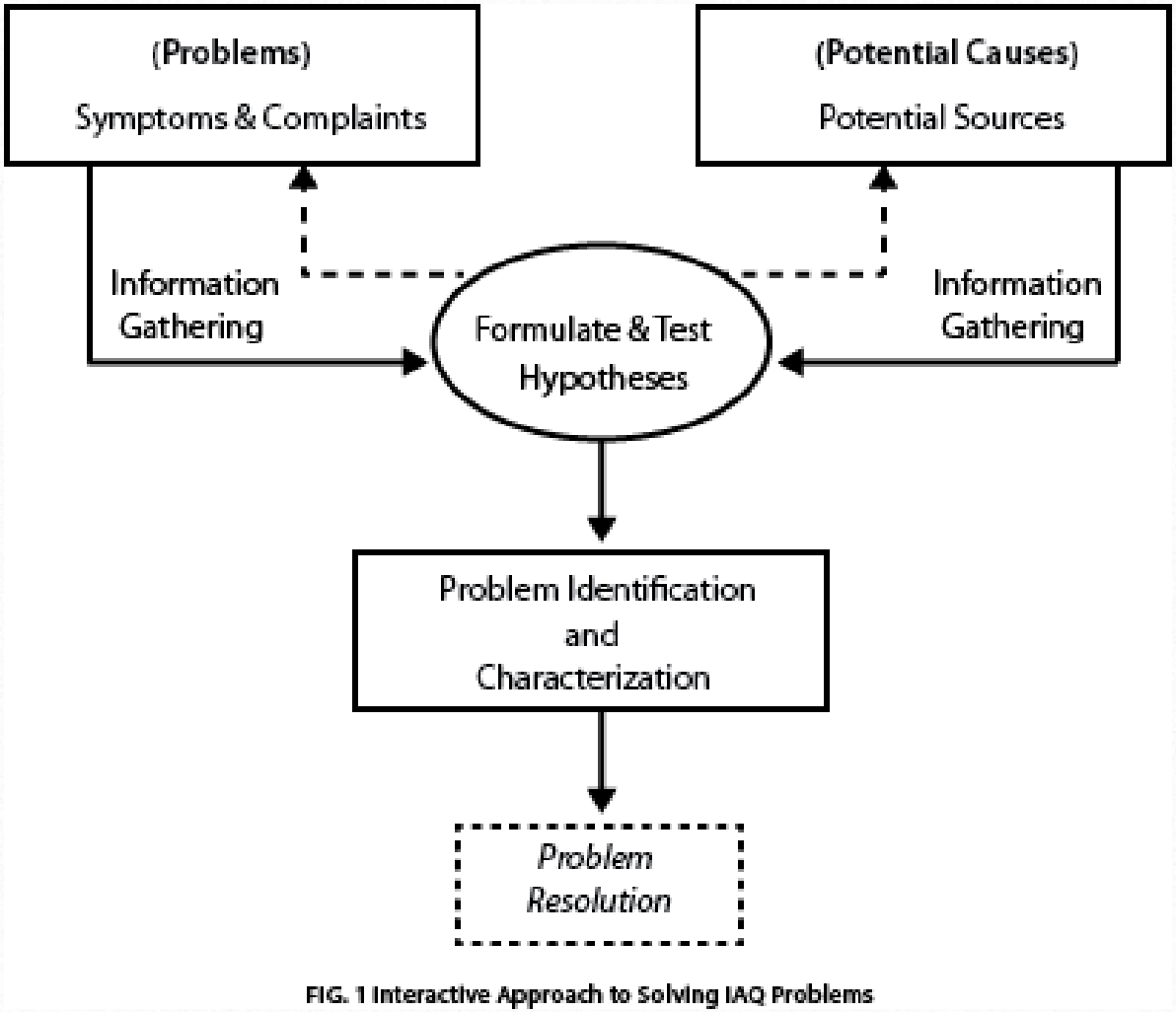


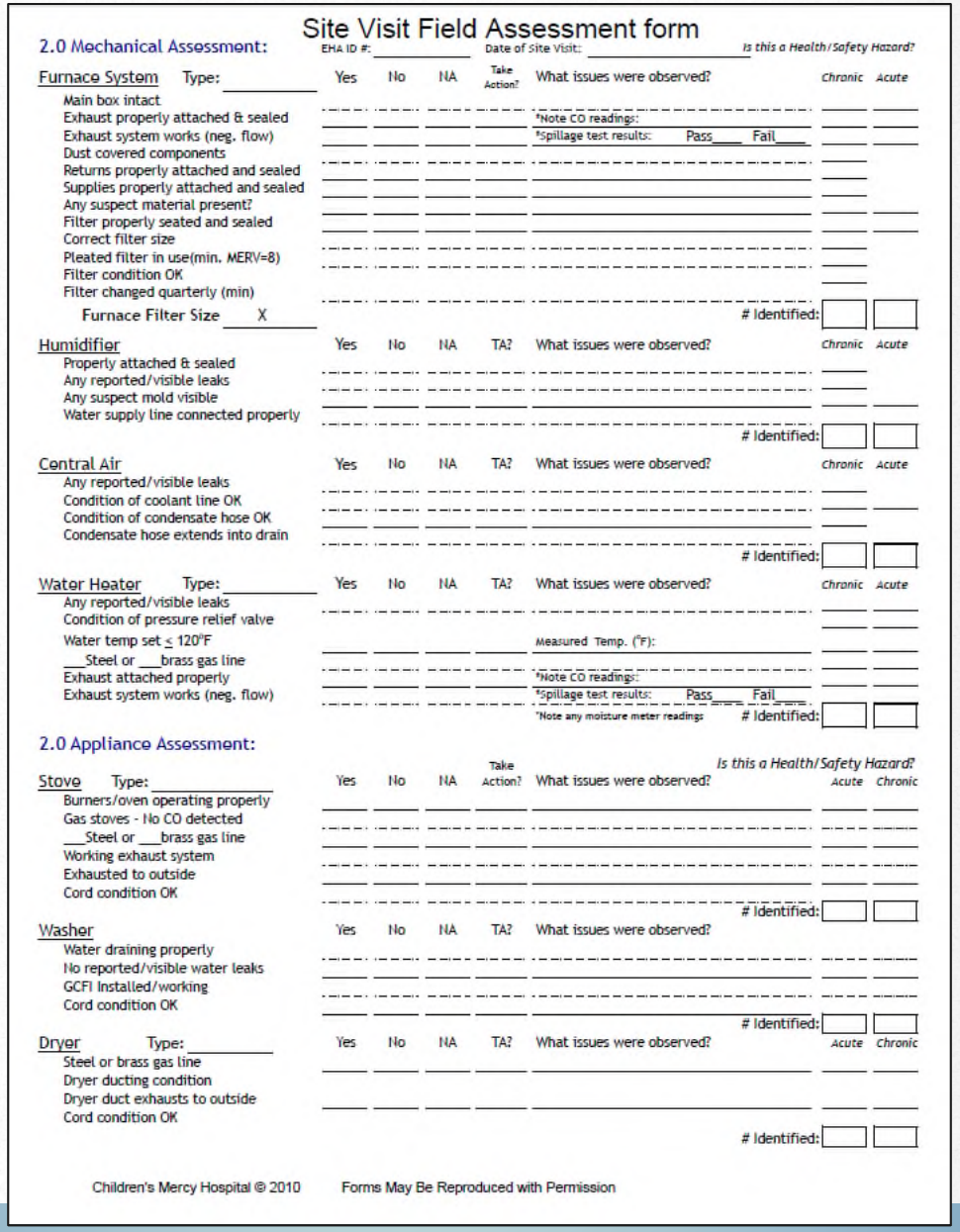
FIG. 1 Interactive Approach to Solving IAQ Problems

From: ASTM-7297-Indoor Air Quality Assessment, American Society of Testing and Measurement (ASTM)

Visual Assessment

Mechanical Components:

- Furnace/AC
- Window AC
- Water Heater
- Main Plumbing
- Kitchen Plumbing
- Bathroom Plumbing



Site Visit Field Assessment form

EHA ID #: _____ Date of Site Visit: _____ *Is this a Health/Safety Hazard?*

2.0 Mechanical Assessment:

Furnace System Type: _____

	Yes	No	NA	Take Action?	What issues were observed?	Chronic	Acute
Main box intact							
Exhaust properly attached & sealed					*Note CO readings:		
Exhaust system works (neg. flow)					*Spillage test results: Pass___ Fail___		
Dust covered components							
Returns properly attached and sealed							
Supplies properly attached and sealed							
Any suspect material present?							
Filter properly seated and sealed							
Correct filter size							
Pleated filter in use(min. MERV=8)							
Filter condition OK							
Filter changed quarterly (min)							
Furnace Filter Size ___X___					# Identified:		

Humidifier

	Yes	No	NA	TA?	What issues were observed?	Chronic	Acute
Properly attached & sealed							
Any reported/visible leaks							
Any suspect mold visible							
Water supply line connected properly							
					# Identified:		

Central Air

	Yes	No	NA	TA?	What issues were observed?	Chronic	Acute
Any reported/visible leaks							
Condition of coolant line OK							
Condition of condensate hose OK							
Condensate hose extends into drain							
					# Identified:		

Water Heater Type: _____

	Yes	No	NA	TA?	What issues were observed?	Chronic	Acute
Any reported/visible leaks							
Condition of pressure relief valve							
Water temp set ≤ 120°F					Measured Temp. (°F):		
___Steel or ___brass gas line							
Exhaust attached properly					*Note CO readings:		
Exhaust system works (neg. flow)					*Spillage test results: Pass___ Fail___		
					*Note any moisture meter readings # Identified:		

2.0 Appliance Assessment:

Stove Type: _____

	Yes	No	NA	Take Action?	What issues were observed?	Is this a Health/Safety Hazard? Acute	Chronic
Burners/oven operating properly							
Gas stoves - No CO detected							
___Steel or ___brass gas line							
Working exhaust system							
Exhausted to outside							
Cord condition OK							
					# Identified:		

Washer

	Yes	No	NA	TA?	What issues were observed?		
Water draining properly							
No reported/visible water leaks							
GCFI installed/working							
Cord condition OK							
					# Identified:		

Dryer Type: _____

	Yes	No	NA	TA?	What issues were observed?	Acute	Chronic
Steel or brass gas line							
Dryer ducting condition							
Dryer duct exhausts to outside							
Cord condition OK							
					# Identified:		

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Practice

Site & Building Assessment

Photos presented here courtesy of the Center for Environmental Health, Children's Mercy Hospital, © 2010.

What are we looking for ?

What are we asking ?

Safe & Healthy Home Assessment EHA ID #: _____ Date of Site Visit: _____

Name: _____ Phone(s): _____ _____

Address: _____

Site Visit Field Assessment form

Front of House

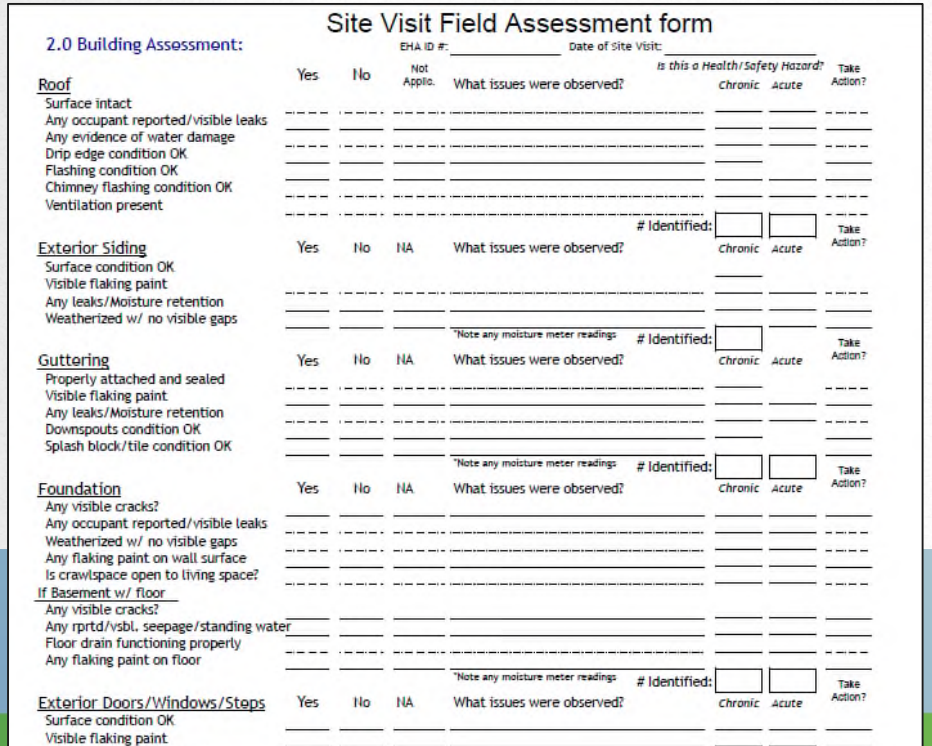
_____ Compass Direction

Building Assessment

What are we looking at?

General Conditions of:

- Roof and Penetrations
- Ventilation
- Flashing
- Eaves
- Siding
- Windows
- Doors
- Trim
- Chimney



Site Visit Field Assessment form

2.0 Building Assessment:

EHA ID #: _____ Date of Site Visit: _____

Roof	Yes	No	Not Applic.	What issues were observed?	Is this a Health/Safety Hazard? Chronic	Acute	Take Action?
Surface intact							
Any occupant reported/visible leaks							
Any evidence of water damage							
Drip edge condition OK							
Flashing condition OK							
Chimney flashing condition OK							
Ventilation present							
				# Identified:			

Exterior Siding	Yes	No	NA	What issues were observed?	Chronic	Acute	Take Action?
Surface condition OK							
Visible flaking paint							
Any leaks/Moisture retention							
Weatherized w/ no visible gaps							
				*Note any moisture meter readings # Identified:			

Guttering	Yes	No	NA	What issues were observed?	Chronic	Acute	Take Action?
Properly attached and sealed							
Visible flaking paint							
Any leaks/Moisture retention							
Downspouts condition OK							
Splash block/tile condition OK							
				*Note any moisture meter readings # Identified:			

Foundation	Yes	No	NA	What issues were observed?	Chronic	Acute	Take Action?
Any visible cracks?							
Any occupant reported/visible leaks							
Weatherized w/ no visible gaps							
Any flaking paint on wall surface							
Is crawlspace open to living space?							
If Basement w/ floor							
Any visible cracks?							
Any rprtd/vsbl. seepage/standing water							
Floor drain functioning properly							
Any flaking paint on floor							
				*Note any moisture meter readings # Identified:			

Exterior Doors/Windows/Steps	Yes	No	NA	What issues were observed?	Chronic	Acute	Take Action?
Surface condition OK							
Visible flaking paint							

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What are we looking for?

Signs of or Evidence of:

- Deterioration
- Chronic issues
- Pest infestation
- Moisture
- Air/gas infiltration

Photos © 2010 Children's Mercy Hospital

What are we asking?

- Are some rooms colder than others?
- Have you seen any rats or mice around the outside or inside of your home?
- Have you had any plumbing problems?
- Other examples?

Visually assess all supply & waste water systems

Photos © 2010 Children's Mercy Hospital

Site Visit Field Assessment form

3.0 EHA Room Survey: Bathroom EHA ID #: _____ Date of Site Visit: _____

	Yes	No	Not Applic.	What issues were observed?	Is this a Health/Safety Hazard? Chronic	Acute	Take Action?
Keep it Ventilated							
Working supply vent							
Supply vent open							
Supply vent unobstructed							
If return vent present - working							
Return vent(s) unobstructed							
Exhaust fan present/operational				Airflow Check: Pass ___ Fail ___			
If windows present-operational							
Room under (-) pressure				*Note airflow readings	# Identified:		

	Yes	No	NA	What issues were observe
Keep it Clean				
Excessive visible dust				
Is any carpeting/upholstery present				
Any cloth window coverings present				

Mechanical Systems, Limited Assessment

Photos © 2010 Children's Mercy Hospital

Site Visit Field Assessment form

2.0 Mechanical Assessment:

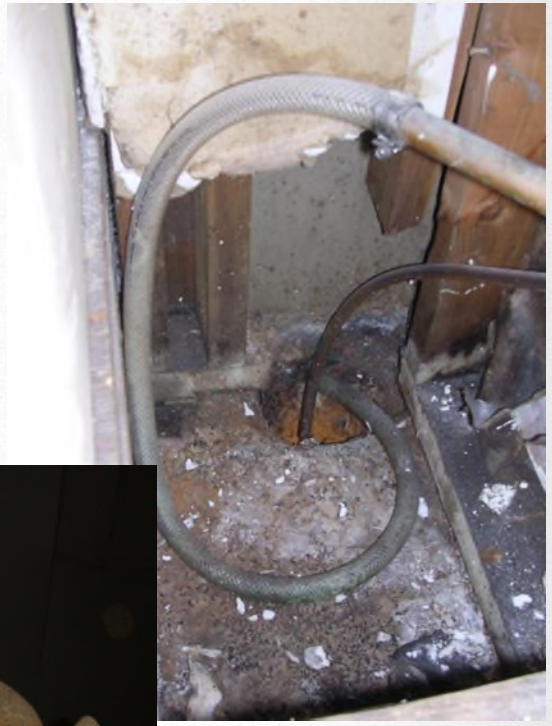
EHA ID #: _____ Date of Site Visit: _____ *Is this a Health/Safety Hazard?*

Furnace System Type: _____	Yes	No	NA	Take Action?	What issues were observed?	Chronic	Acute
Main box intact							
Exhaust properly attached & sealed					*Note CO readings:		
Exhaust system works (neg. flow)					*Spillage test results: Pass____ Fail____		
Dust covered components							
Returns properly attached and sealed							
Supplies properly attached and sealed							
Any suspect material present?							
Filter properly seated and sealed							

What are we looking for?

Photos © 2010 Children's Mercy Hospital

- Visual evidence of damage
- Evidence of moisture issues
- General condition of exhaust vents
  - Check for negative flow
- Are they connected?
- Furnaces, boilers, fireplaces vented
  - Check both ends if possible



Home Appliances, Limited Assessment

*Note any moisture meter readings: # Identified:

2.0 Appliance Assessment:

Photos © 2010 Children's Mercy Hospital

Stove Type: _____

- Burners/oven operating properly
- Gas stoves - No CO detected
- ___Steel or ___brass gas line
- Working exhaust system
- Exhausted to outside
- Cord condition OK

Washer

- Water draining properly
- No reported/visible water leaks
- GCFI Installed/working
- Cord condition OK

Yes	No	NA	Take Action?	What issues were observed?	Is this a Health/Safety Hazard? Acute	Chronic

Identified:

Yes	No	NA	TA?	What issues were observed?

What are we looking for and asking?

- Bath, dryer, and range exhaust fans?
  - Do they work?
  - Are they used?
  - Exhaust to outside?
- Gas stove used as heater?
- Smoke alarm ever go off?
- CO Monitor present and working?
  - Ever go off?
- Do they bake or cook for long periods?

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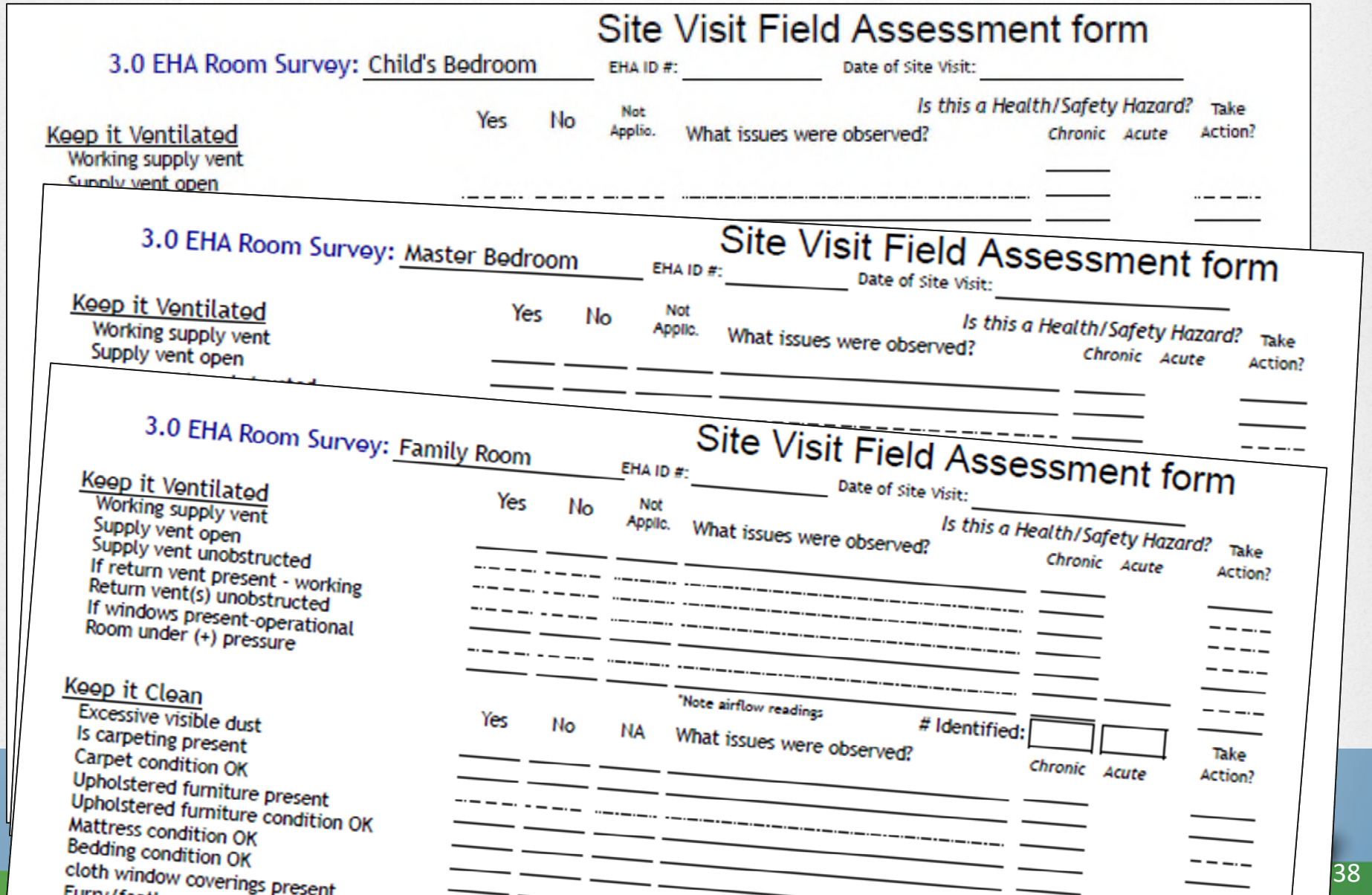
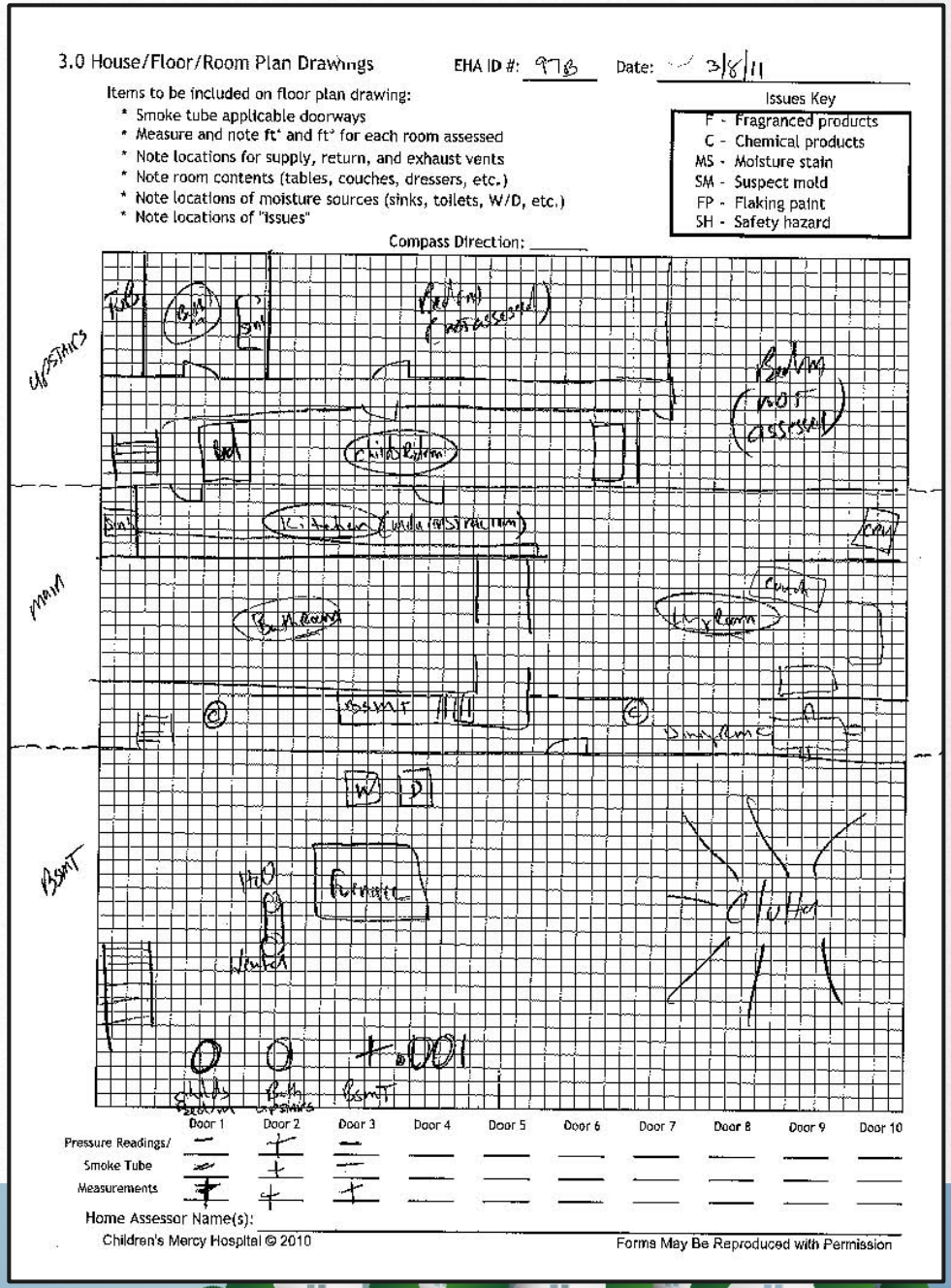
Room by Room Assessment



Floor Plan Drawing

- Beneficial for:
  - Locating environmental contaminants in relation to rooms
  - Understanding exposure pathways
  - Remembering Home Layout



Things to Look for in Rooms

- Windows, do they work?
- Evidence of condensation
- Evidence of moisture stains
- Number of moisture reservoirs
- Number of dust reservoirs
- Lingering odors or stale air
- Level of cleanliness
- Level of clutter
- Smoke alarms observed?
- Unvented gas or kerosene heaters
- Overload electric cords

Good things to ask about rooms

- Is this how this room typically looks?
- Do the windows work?
- Has your smoke detector ever gone off?
- Has your CO detector ever gone off?
- Have you noticed lingering odors?
- Do your windows ever fog?
- Do you have other examples?

Keep it Ventilated

- Working supply vent
- Supply vent open
- Supply vent unobstructed
- If return vent present - working
- Return vent(s) unobstructed
- If windows present-operational
- Room under (+) pressure

Yes	No	Not Applic.	What issues were observed?	Is this a Health/Safety Hazard? Chronic	Acute	Take Action?
			*Note airflow readings	# Identified:		Take

Photos © 2010 Children's Mercy Hospital

Keep it Dry	Yes	No	NA	What issues were observed?	# Identified: Chronic	Acute	Take Action?
Observed damp smell							
Any visible moisture stains							
Any reported/visible window leaks							
Observed room humidifier							
Any mold smell							
Any observed suspect visible mold							

Visible mold ranking:

*Note any moisture meter readings

Area affected:	0	<2 sq.ft.	<10	>10	>30	>100

Photos © 2010 Children's Mercy Hospital

Keep it Clean	Yes	No	NA	What issues were observed?	Chronic	Acute	Action?
Excessive visible dust							
Is carpeting present							
Carpet condition OK							
Upholstered furniture present							
Upholstered furniture condition OK							
Mattress condition OK							
Bedding condition OK							
cloth window coverings present							
Furry/feathered pets allowed in room							
Observed clutter							
Observed trash/debris on surfaces							
				# Identified:			Take

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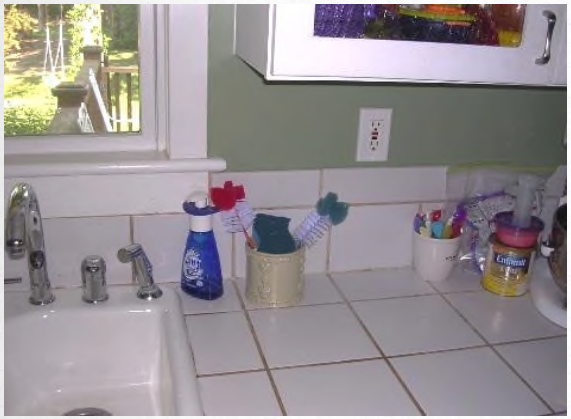

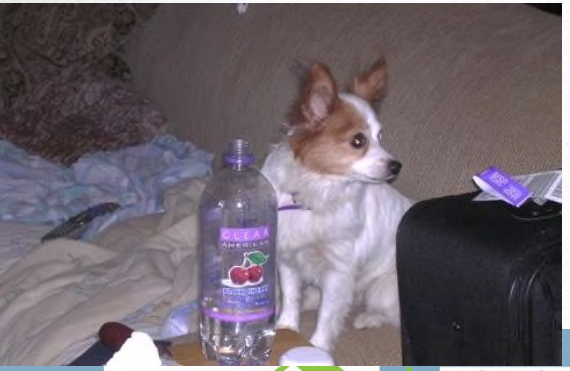

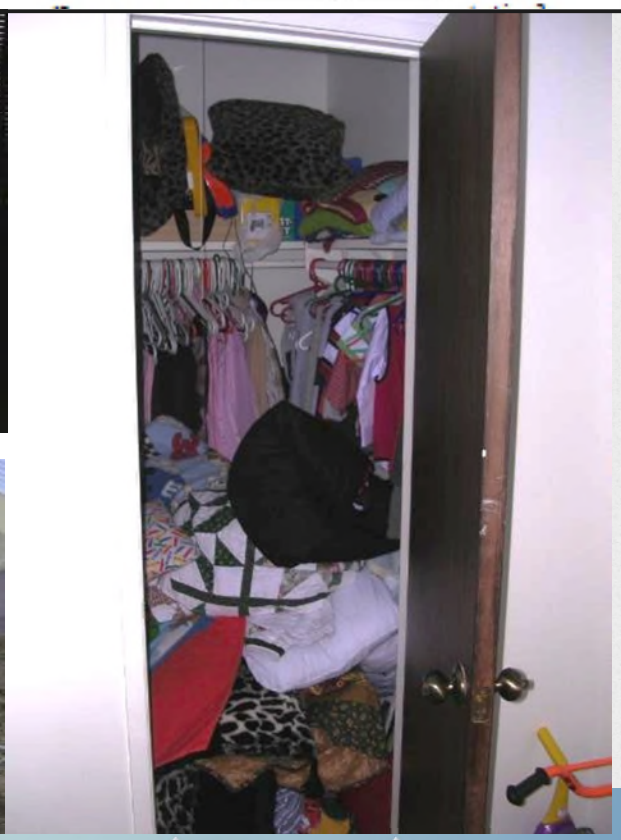

Keep it Contaminant-Free	Yes	No	NA	What issues were observed?	# Identified: Chronic	Acute	Take Action?
Is smoking allowed in room							
Observed chemical odors							
Any Observed air fresheners							
Any observed candles or incense							
Any reported/visible chemical supplies							
Any flaking paint on any surface							

Flaking Paint Ranking:

Area affected:	0	<1 sq.ft.	1-2	2-4	4-10	>10

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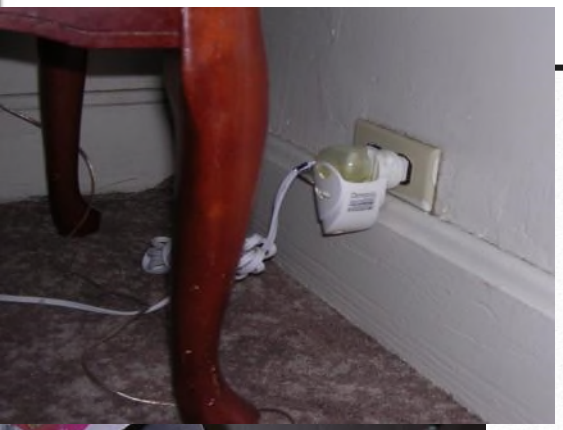

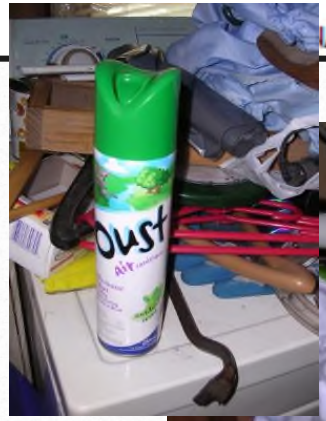

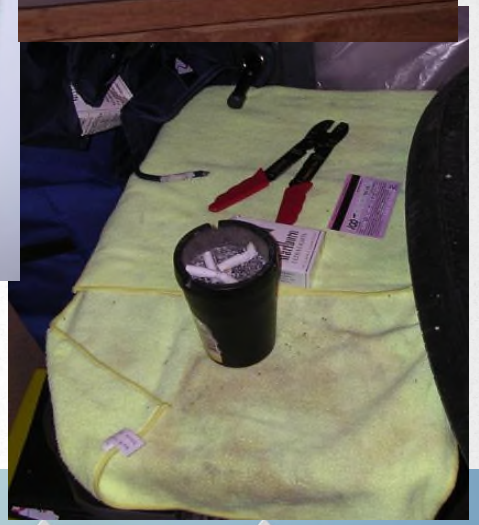

Keep it Safe	Yes	No	NA	What issues were observed?	Chronic	Acute	Action?
Smoke detector in /near room							
CO detector near room							
Observed overloaded/small gauge ext. cords							
Observed loose flooring							
Small Children (<7 yrs old):							
Receptacle plug covers							
Any blind/curtain cords w/in reach							
Window guards (2nd Floor) present							
Medicines out of reach							
				# Identified:			
				Total Hazards Identified:			

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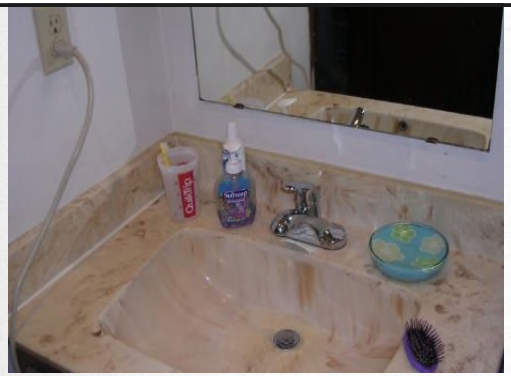

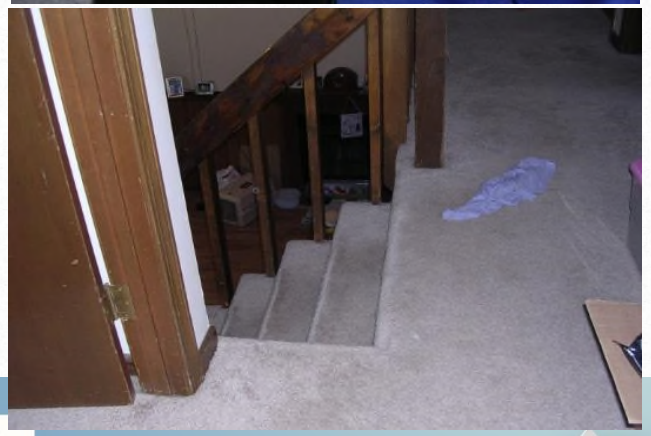

Extra Focus on Pests

Exercise on Identify Pest Problems

Visual identification of hazards

	Keep it Principles						
AREAS	Dry	Clean	Pest-free	Ventilated	Safe	Contaminant-free	Maintained
Building – exterior shell							
Area around the building							
Mechanical equipment and appliances							
Interior rooms							
Kitchens and bathrooms							